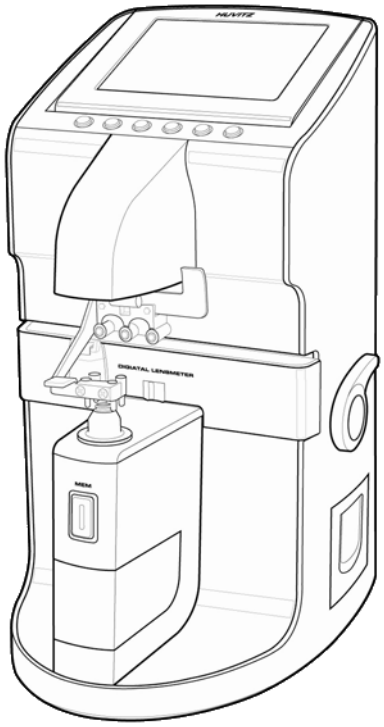
HLM-7000 DIGITAL LENSMETER

USER GUIDE



Huvitz
Pacing Progress toward People

IMPORTANT NOTICE

This product may malfunction due to electromagnetic waves caused by portable personal telephones, transceivers, radio-controlled toys, etc. Be sure to avoid having objects such as, which affect this product, brought near the product.

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1. Introduction

1.1. Outline of the instrument

The Automatic Lensmeter HLM-7000 is the equipment for measuring the refractive power of lenses and gives the spherical, cylindrical and axis of the lenses.
The Automatic Lensmeter HLM-7000 also contains the PD(=pupil distance) measurement and the UV Protection Ratio Test. The automatic lensmeter HLM-7000 can measure both the uncutted singular lenses and the framed glasses. Recently the Bi-Focal lenses or Progressive lenses for the elderly can be check with this equipment. And also this instrument can measure soft contact lenses easily and accurately using the specialized mechanical jig and the detailed display.

1.2. Classification

Protection against electric shock: Class I(earthed)
Installation Category: II
Pollution Degree: 2

2. Safety Information

2.1. Introduction

Safety is everyone's responsibility. The safe use of this equipment is largely dependent upon the installer, user, operator, and maintainer. It is imperative that personnel study and become familiar with this entire manual before attempting to install, use, clean, service or adjust this equipment and any associated accessories. It is paramount that the instructions contained in this manual are fully understood and followed to enhance safety to the patient and the user/operator. It is for this reason that the following safety notices have been placed appropriately within the text of this manual to highlight safety related information or information requiring special emphasis. All users, operators, and maintainers must be familiar with and pay particular attention to all Warnings and Cautions incorporated herein.

⚠ WARNING

"Warning" indicates the presence of a hazard that could result in severe personal injury, death or substantial property damage if ignored.

NOTE

"Note" describes information for the installation, operation, or maintenance of which is important but hazard related if ignored.

⚠ CAUTION

"Caution" indicates the presence of a hazard that could result in minor injury, or property damaged if ignored.

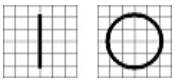
INFORMATION

"Information" each page will briefly describe the information being requested and the browser will open with information relative to your position.

2.2. Safety Symbols

The International Electrotechnical Commission (IEC) has established a set of symbols for medical electronic equipment which classify a connection or warn of any potential hazards. The classifications and symbols are shown below.

Save these instructions

	I and O on power switch represent ON and OFF respectively.
	This symbol identifies a safety note. Ensure you understand the function of this control before using it. Control function is described in the appropriate User's or Service Manual.
	Manufactured by xxxx (year).
	Identifies the point where the system safety ground is fastened to the chassis. Protective earth connected to conductive parts of Class I equipment for safety purposes.

Extra Symbols

COM	External serial communication port. User can transmit the memorized data to other equipment such as Huvitz's other machines or PC.

2.3. Environment factors

Avoid the following environments for operation or storage

	Where the equipment is exposed to water vapor. Don't operate an equipment with a wet hand.
	Where The temperature changes extremely. Normal operating temperature range is from 10°C to 40°C, Humidity is from 50% to 80%.
	Where the humidity is extremely high or there is a ventilation problem.
	Where equipment is exposed to chemical material or explosive gas.
	Where the equipment is exposed to direct sunlight.
	Where it is near the heat equipment.
	Don't disassemble the product or open. We aren't responsible for it for nothing.

	Don’t plug the AC power cord into the outlet Before the connection between devices of the equipment is completed. This can generate the defect.
	Where the equipment is subject to excessive shocks or vibrations
	Be careful not to be inserted dust, especially, metal..
	Pull out the power cord with holding the plug, not the cord.

Avoid places where the ambient temperature falls below 10℃ or exceeds 40℃ for normal operation or below -5℃ or exceeds 50℃ (14˚F-104˚F) for transportation and storage. Humidity should be maintained between 50 and 80% for normal operation, transportation and storage. Avoid environments where the equipment is exposed to excessive shocks or vibrations.

At operating and non-operating, the warranted environments of temperature and Humidity are as followings:

At operating : to 80% from +10°C to +31°C, and decreasing linearly to 50% from +31°C to +40°C

At storage : to 90% from -5°C to 40°C, and to 30% from +40°C to +50°C decreasing linearly to 50 percent

The warranted altitude is as following:

At operating : to 6,560ft(2,000m)

At storage : to 14,280ft(6,000m), non-operating

2.4. Safety Precautions

This equipment has been developed and tested according to safety standards as well as national and international standards. This guarantees a very high degree of safety for this device. The legislator expects us to inform the user expressively about the safety aspects in dealing with the device. The correct handling of this equipment is imperative for its safe operation. Therefore, please read carefully all instructions before switching on this device. For more detailed information, please contact our Customer Service Department or one of our authorized representatives.

1. This equipment must not be used (a) in an area that is in danger of explosions and (b) in the presence of flammable, explosive, or volatile solvent such as alcohol, benzene or similar chemicals.

2. Do not put or use this device in humid rooms. Humidity should be maintained between 50 and 80% for normal operation. Do not expose the device to water splashes, dripping water, or sprayed water. Do not place containers containing fluids, liquids, or gases on top of any electrical equipment or devices.

3. The equipment must be operated only by, or under direct supervision a properly trained and qualified person.

4. Modifications of this equipment may only be carried out by Huvitz's service technicians or other authorized persons.

5. Customer maintenance of this equipment may only be performed as stated in the User's Manual and Service Manual. Any additional maintenance may only be performed by Huvitz's service technicians or other authorized persons.

6. The manufacturer is only responsible for effects on safety, reliability, and performance of this equipment when the following requirements are fulfilled: (1) The electrical installation in the respective room corresponds to the specifications stated in this manual and (2) This equipment is used, operated, and maintained according to this manual and Service Manual.

7. The manufacturer is not liable for damage caused by unauthorized tampering with the device(s). Such tampering will forfeit any rights to claim under

warranty.

8. This equipment may only be used together with accessories supplied by Huvitz's. If the customer makes use of other accessories, use them only if their safe usability under technical safety aspects has been proved and confirmed by Huvitz or the manufacturer of the accessory.

9. Only persons who have undergone proper training and instructions are authorized to install, use, operate, and maintain this equipment.

10. Keep the User's Manual and Service Manual in a place easily accessible at all times for persons operating and maintaining the equipment.

11. Do not force cable connections. If a cable does not connect easily, be sure that the connector (plug) is appropriate for the receptacle (socket). If you cause any damage to a cable connector(s) or receptacle(s), let the damage(s) be repaired by an authorized service technician.

12. Please do not pull on any cable. Always hold on to the plug when disconnecting cables.

13. This equipment may be used for the international application related to the inspection of general lenses according to this manual.

14. Before every operation, visually check the equipment for exterior mechanical damage(s) and for proper function.

15. Do not cover any ventilation grids or slits.

16. Immediately turn off and unplug any equipment that gives off smoke, sparks, strange noises, or odors.

3. Features

1. You can measure the center and refraction power of lenses with ease and rapidity.

2. In case of framed lens, single/binocular PD can be measured automatically in addition to the refraction power of each lens.

3. Transmission ratio of UV (Ultra Violet) light can also be measured with this HLM-7000.

4. HLM-7000 provides the wide measurement range from –25D to +25D.

5. HLM-7000 supports precise measurements guaranteed by 0.01D measurement unit.

6. Measuring progressive multi-focal lenses and general multi-focal lenses can be performed easily and rapidly.

7. HLM-7000 can measure soft contact lenses easily and accurately using the specialized mechanical jig and the display.

8. HLM-7000 supports gorgeous displays through the proper colored LCD.

9. The measured data can be provided to the customers by using the printing function.

4. Notes for using the instrument

1. Do not hit or drop the instrument. The instrument may be damaged if it receives a strong impact. The impact can damage the function of this instrument. So handle with care.

2. Install this instrument on a level, stabilized table with no vibration to keep it normal state.

3. Exposure to direct sunlight or very bright indoor lights can influence the results of measurements.

4. If you want to connect this with other equipments, consult the dealer.

5. Sudden heating of the room in cold areas will cause condensation of vapor on the protective glass in the measurement window and on optical parts inside the instrument. In this case, wait until condensation disappears before performing measurements.

6. To get accurate measurements, always keep it clean. Dust may result in malfunction. After using this instrument, turn off power supply and keep the dust cover over it.

7. Don't use organic solution such as thinner, benzene, etc. to clean the surface of this instrument. It may damage the instrument

8. There is a risk of explosion if an incorrect type of battery is used. Dispose used batteries according to the instructions.

9. Disconnect the power supply and consult the dealer in case of smoke, strange odors, or noise during operation.

10. Don’t place anything on the lens cap while this instrument is turning on. This instrument should perform the self-test at start-up.

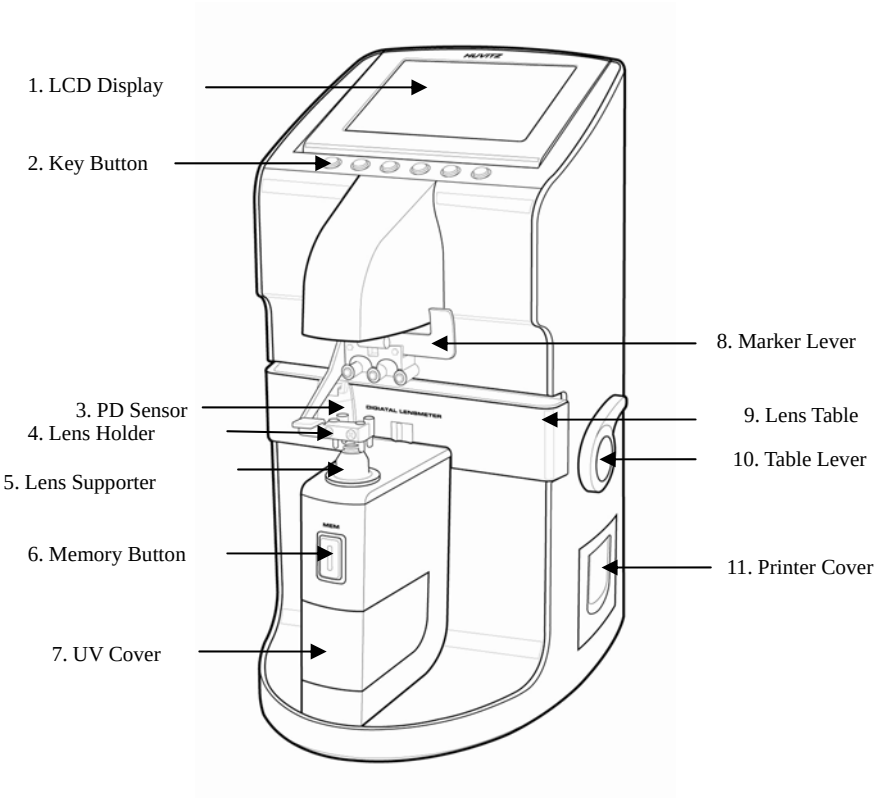
11. Don’t turn off the Display Protection Mode without an unavoidable reason.

That’s why this instrument should perform the Display Protection function for the display protection as well as the compensation of temperature.

12. Don’t place anything on the lens cap when you wake up this instrument from the display protection state. That’s why this instrument should perform the compensation of temperature at the moment.

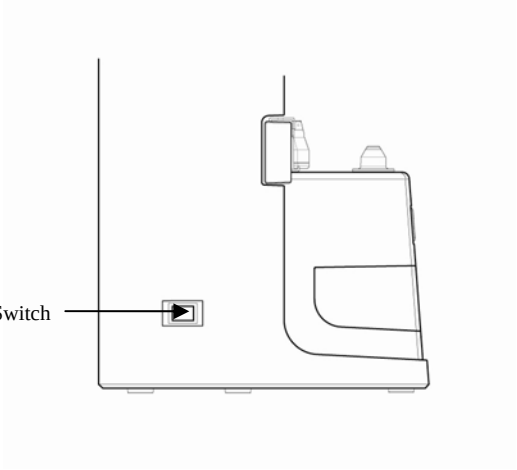
5. Configurations

5.1. Main Unit

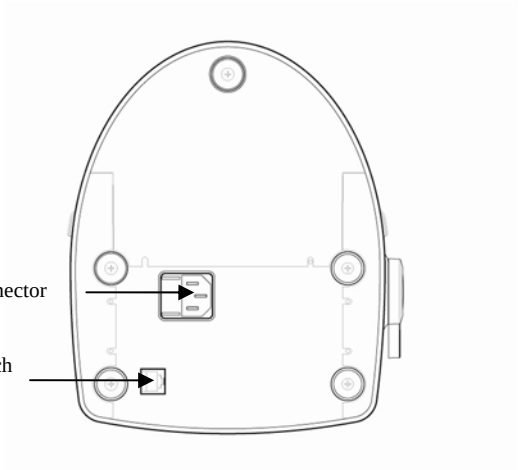


[Figure 1. Component Names (I)]

1. LCD Display	2. Key Button	3. PD Sensor
4. Lens Holder	5. Lens Supporter	6. Memory Button
7. UV Cover Table	8. Marker Lever	9. Lens Table
10. Table Lever	11. Printer Cover	



[Figure 2. Component Names (II)]



[Figure 3. Component Names (III)]

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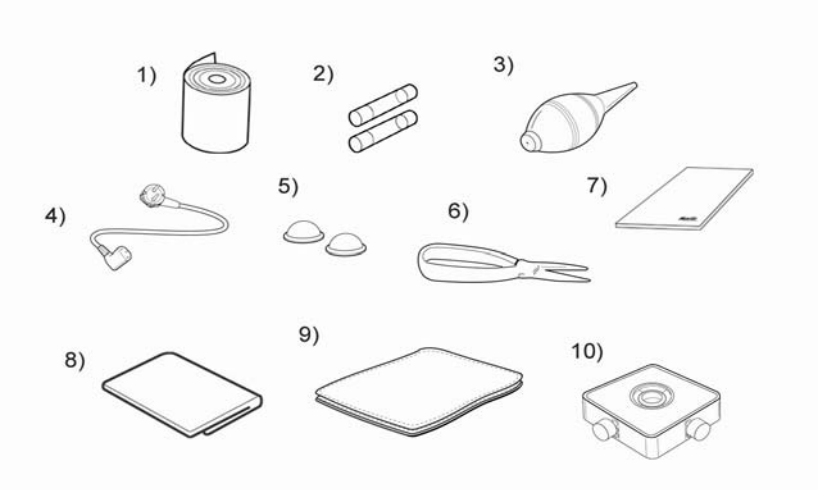
1. Power Switch 2. Power Connector 3. Foot Switch Connector

5.2. Accessories

1) Printing Paper : Rolled paper for printing
2) Fuse(250V 3.15A) : (2ea)
3) Blower : A blower for removing dust on a pinhole
4) Power Cord(Angle Type)
5) Filter Cap : Cap for protection against dust (2ea)
6) Tweezers : A kind of tool to pick up the contact lens
7) Operator's Manual : Operator manual for users
8) Dust Cover : Polyvinyl cover for protection against dust
9) Lens Cleaner : A cloth for removing dust on a lens
10) Contact Lens Jig : mechanical jig for measuring a contact lens (Optional)



[Figure 4. Accessories]

6. Settings and Preparation for Operating

6.1. Receiving inspection

Step 1. Checking accessories.

Open the box and make sure that all the accessories (printing paper, protection cover, soft cloth for a lens, user's manual) are in it

Step 2. Removing the protection tape.

Remove the protection tape from the lens holder, lens support, marking pen and the UV cover.

6.2. Test at Start-up

Step 1. Connecting the power cable.

Connect the cable into the power receptacle on the bottom of the body.

Step 2. Checking the initial status.

Turn on the power switch and make sure that this instrument is functioning properly. While starting the equipment, be sure not to place anything on the lens cap. If you encounter any problem with your equipment during boot-up, you'll see the following message on the screen display.

"No Signal" or **"Out of range"**

If so, clean the 4-pin hole. Refer to Section 11.2 'How to clean the 4-pin hole'. And then turn on again. If the problem persists, please contact your local distributor or the manufacturer. Refer to the chapter 14. 'Service Information' In summary, the testing procedures at start-up are as followings.

a. Turn on the machine. Make sure that there is nothing on the lens cap.
b. If you encounter the message “No Signal” or “Out of range”, please clean the 4-pin hole. And then turn on again.
c. If the problem persists, please contact your local distributor or the manufacturer.
d. Otherwise, check the values SPH, CYL, AXIS at Measurement Screen about which is explained in the section 8.1 ‘Measurement screen’.
e. If SPH, CYL, or AXIS aren’t zero, clean the 4-pin hole. And then turn off and on again. If the problem persists, please contact your local distributor or the manufacturer.
f. If SPH, CYL, and AXIS are zero, it’s okay with your equipment.

6.3. Display protection function

When the instrument is not used for a few minutes, display protection function works automatically. In display protection mode, the instrument shows several different pictures for protecting the display component. If you press any button on this mode, it will return to the measurement screen. Be sure that don’t turn off this display protection function in the User Setup Display without an unavoidable reason.

7. Buttons For Operations

7.1. Switching Screen According To the Button Selection

[Figure 5. Switching Screen According To the Button Selection]

7.2. Usage of buttons

MODE

Setup Screen will be shown

TRNS

To transpose the sign of cylindrical reading

PROG

Enter the Progressive Multi-Focal Screen

SOFT CNCT

To go into the display for soft contact lens

HARD CNCT

To go into the display for hard contact lens

UV

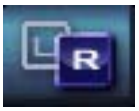
To Enter the UV Measurement Screen

D-SUN

To measure the heavy dark sunglass lens

LENS

To return to the display for the normal lens

 **S→R**

In case of single lens, you can switch between left and right selection of the framed lens or you can select left /right lens

CLEAR

To Initialize data and convert screen. You can initialize data and screen by using this button

PRINT

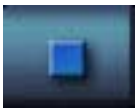
To print the current memorized data

CAL

To set the current state of transmission into 100%

RUN

To start recording the current data

 **STOP**

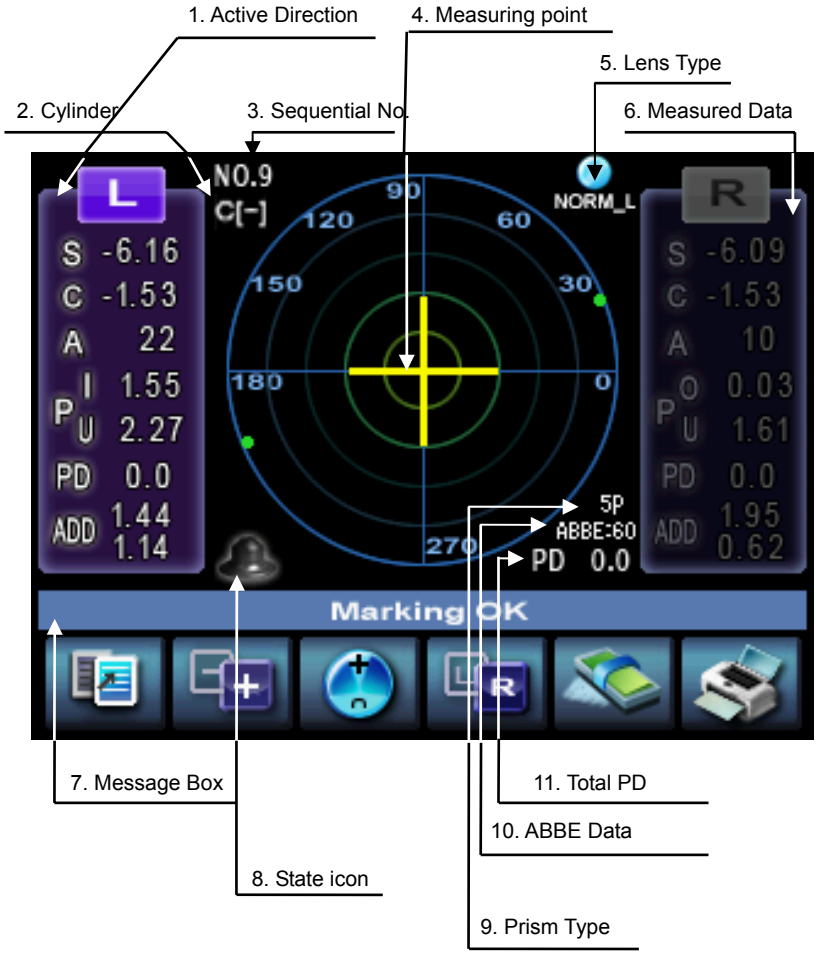
To stop recording the current data and to memorized the average value

MEM button

To memorize the current measured-value

8. Description of Screen Layout

8.1. Measurement Screen



[Figure 6. Screen Layout]

8.1.1. Detail explanation

① Active Direction

Tells whether current lens is a single or a left/right lens.

② Cylinder

Displays the cylinder value with (+) sign when the power has (+) value and with (-) sign when the power has (-) value.

③ Sequential No

Show the sequential No for the customer identity.

④ Measuring point

Show the current measuring point on the surface of the lens.

⑤ Lens Type

Tells whether the current lens in measuring is a general lens, a progressive lens, a soft contact lens, a hard lens, a uv lens or a d-sunglasses lens, .

⑥ Measured Data

Box for displaying the measured data. Each meaning of the content is as shown below.

- S : basic power
- C : cylinder power
- A : cylinder axis
- P : prism X, prism Y
- PD : RPD or LPD
- ADD : progressive power 1 and 2

⑦ Message Box

Notifies states of measurement and warnings and so on.

- ALIGNMENT OK : is displayed when the optical center falls within 0.5 prism.
- MARKING OK : is displayed when the optical center is precise. And it tells that you can mark focus and cylindrical axis after you adjust the angle using the marking lever.
- NO SIGNAL : is displayed when there is no signal.
- Out Of Range : is displayed when there is out of range signal.
- Printing : is printing.
- Unstable Signal : contact lens measurement, when signal is bad, appear.

⑧ State Icon

Represents that there is no lens inserted on the left-bottom of the screen. If you insert a lens, a figure will be shown, which illustrates lens on the lens support.

INFORMATION

The lens icon with a curved band represents the progressive lens inserted on the lens cap.

⑨ Prism Type

Is displayed selecting 5 Prism, 10 Prism.

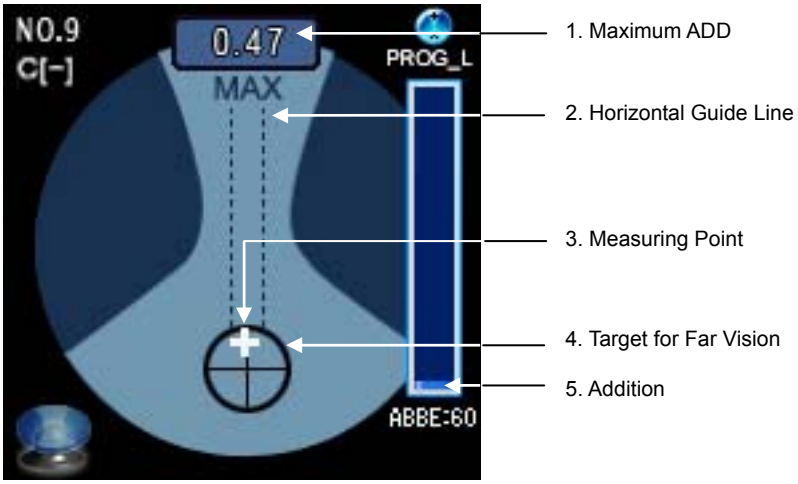
⑩ ABBE Data

Is displayed ABBE Value.

⑪ Total PD

Shows the total PD reading that is the summation of the left PD reading and the right PD reading.

8.2. About the progressive display



[Figure 7. The display for the progressive powered lens]

8.2.1. Detail explanation

① Maximum ADD

The maximum additive value after detecting the far vision focus.

② Horizontal Guide Line

This line is a guide for moving the cross marker while finding the near focus.

③ Measuring Point

This cross marker displays the current measuring point while finding the far focus.

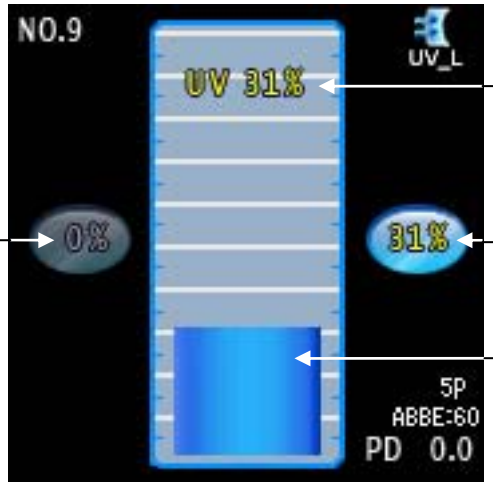
④ Target for Far Vision

You should move the cross marker to the center of the target for far focus.

⑤ Addition

This rectangle shows the current ADD value.

8.3. UV Screen



[Figure 8. UV Screen Layout]

8.3.1. Detail explanation

① Left Transmission Ratio

Shows the left-side stored value.

② Current Transmission Ratio

Displays the transmission ratio in a bar graph form.

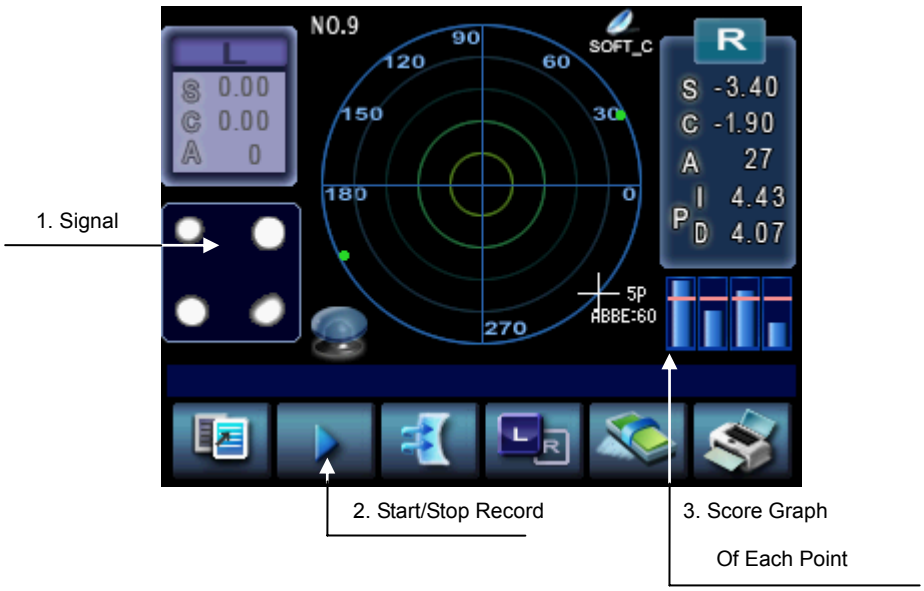
③ Right Transmission Ratio

Shows the right-side stored value.

④ Transmission Height

Shows the height of the current transmission height.

8.4. Contact Lens Display (Soft, Hard)



[Figure 9. Contact Lens Display]

8.4.1. Detail explanation

① Signal

Shows the share of every signal.

② Start/Stop Record

Start : Start recording the continuous measurement.
(Stop: Stop recording the continuous measurement, calculates the average value of all readings and then stores them.)

③ Score Graph for Each Point

Shows the score of every signal. If one of them is lower than the criteria line, the reading at that moment must be thrown away.

8.5. D-Sunglasses Lens Display

[Figure 10. D-Sunglasses Lens Display]

8.6. Setup Screen

[Figure 11. Setup Display]

8.6.1. Detail explanation

LENS

- NORMAL : normal lens
- PROGRESSIVE : progressive lens
- SOFT CONTACT : soft contact lens
- HARD CONTACT : hard contact lens
- UV : uv lens
- D-SUNGLASSES : dark sunglasses lens

CYLINDER

- MIX : displays the cylinder value with (+) sign when the power has (+) value and with (-) sign when the power has (-) value.

- + : always displays the cylinder value with (+) sign.
- - : always displays the cylinder value with (-) sign.

PROGRESSIVE AUTO

- ON : auto detection of progressive lens.
- OFF : turns off the progressive function.

AUTO MEASURE

- ON : turns on auto storing function.
- OFF : turns off auto storing function.

AUTO R/L

- ON-R/L : turns on auto decision of right or left lens. Initially, this system is ready for measuring the right lens.
- ON-S/R/L : turns on auto decision of right or left lens. Initially, this system is ready for measuring the single lens.
- OFF : turns off auto decision of right or left lens.

PRISM

- NO DISPLAY : will not display the prism information.
- X-Y : displays the prism information in X-Y coordinates.
- P-B : represents the prism information with absolute distance and angle.
- mm : displays the center difference in (x, y) coordinate by millimeter (mm).

ABBE

- NORMAL XX : value applied ABBE constant
- MID XX : value applied ABBE constant
- LOW XX : value applied ABBE constant. This can be applied to the high-refractive lens.

└ NORMAL XX

- XX : designated value for NORMAL ABBE(=50~60)

└ MID XX

- XX : designated value for MID ABBE(=40~49)

└ LOW XX

- XX : designated value for LOW ABBE(=30~39)

DISPLAY

- 5 P MODE : display unit 5 P.
- 10 P MODE : display unit 10 P.

BPS

Selects the speed of the external communication

- 9600 : communication speed by 9600.
- 19200 : communication speed by 19200.
- 38400 : communication speed by 38400.
- 57600 : communication speed by 57600.
- 115200 : communication speed by 115200.

STEP

- 0.25 : display unit 0.25
- 0.125 : display unit 0.125
- 0.01 : display unit 0.01

WAVELENGTH

- e-Line : displays the refractive power according to e-Line
- d-Line : displays the refractive power according to d-Line

SLEEP MODE

- ON : turns on the display protection mode.
- OFF : turns off the display protection mode.

RS-232C

Selects the protocol of RS-232C

- OFF : turns off the external communication
- LMTORK(OLD) : turns on the protocol between HLM Model and MRK, HRK, CDR, HDR series.
- LMTORK(V2) : turns on the bilateral protocol between HLM Model and MRK, HRK, CDR, HDR series.

BEEP

- ON : turns on the beep sound function.
- OFF : turns off the beep sound function.

CONTACT REC

- MANUAL REC : stop the continuous measurement by pressing [STOP] button by user.
- AUTO REC XXs : measure for the specified second and then stop automatically.

AUTO REC

- XXs : designate the seconds for the continuous measurement.

NAME

You can input the company name here. The company name will be displayed at the upper part of the printing paper.

INFORMATION

Select the input string by using the second, third, fourth and the fifth buttons from the left side and select the displaying position by the sixth button. Pressing the first button causes escape without saving and pressing the last button (sixth button) at the SAVE yields saving the changes.

PD

- ON(DEFAULT) : turns on the PD function
- OFF : turns off the PD function
- ON(AVERAGE ST.) : turns on the special PD function that makes the RPD and LPD even in case that the difference between RPD and LPD is less than 3mm.

FOOT SW

- ON : turns on the foot switch (Use MEM button equality)
- OFF : turns off the foot switch

PRISM STEP

- 0.25 : display unit 0.25
- 0.125 : display unit 0.125
- 0.01 : display unit 0.01

FRAME GRAPH

- ON : print the frame graph at printing.
- OFF : doesn't print the frame graph at printing.

LANGUAGE

- HUVITZ MODE : display as the general English mode.
- CHINESE MODE : display as the Chinese mode.
- VELO MODE : display as the VELO MODE, which is the one of customized displaying.

SHOW SEQ NO

- ON : show the sequential number for customer at the display.
- OFF : doesn't show the sequential number for customer at the display.

PRINTER

- ON : turns on the printing.

- OFF : turns off the printing.

AUTO PRINTER

- ON : turns on the auto printing.
- OFF : turns off the auto printing.

INFORMATION

If you take out the test lens from the lens cap after finishing the measurement, the measured data is automatically printed out.

INFORMATION

Using 'AUTO MEASURE', 'AUTO PRINTER', 'RS-232C', and 'PRINTER', you can achieve the full automatic measurement.

TIME

To configure date and time.

INFORMATION

Select the input position by the left fourth and the fifth button and increase/decrease the number by the second and the third button. Pressing the first button causes escape without saving and pressing the last button (sixth button) at the SAVE yields saving the changes.

SEQ. NO.

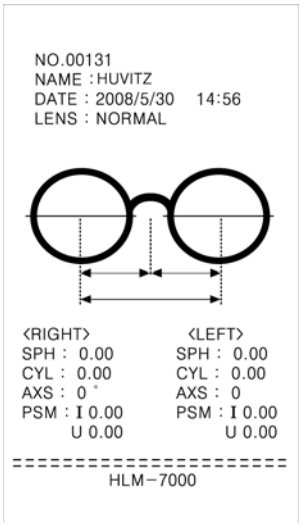
- RESET : set the customer No 0.

EXIT

Escapes with out saving.

8.7. Printout Format

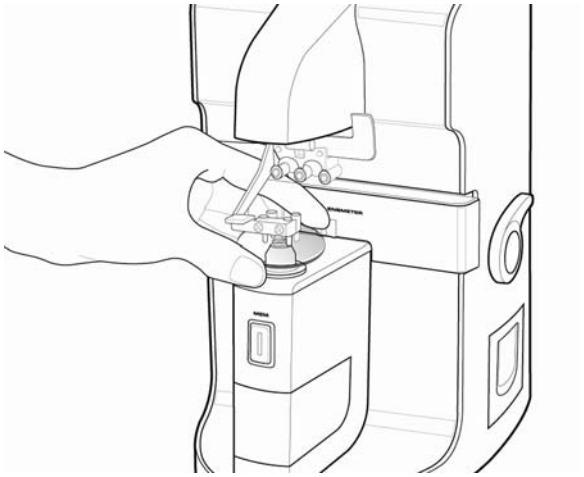
Printout format is as follows



[Figure 12. Printout Format of Framed Glass]

9. Measurements

9.1. Normal lenses

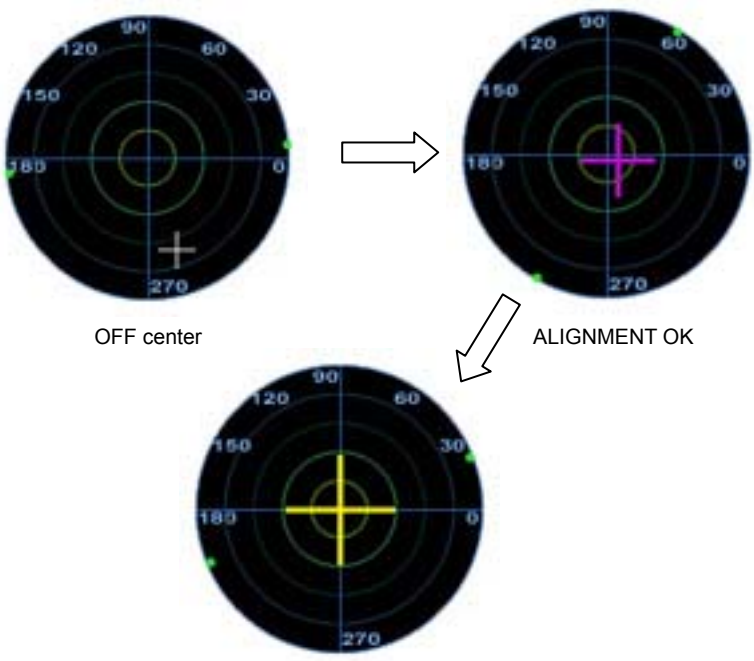


[Figure 13. How To Measure a Normal Lens]

Step 1 Press ‘CLEAR’ button( ) to initialize the state of measurement. The symbol ‘S’ must appear on the upper-right part of the screen. (But, ‘ AUTO R/L ’ function is turned ON-R/L in SETUP mode, ‘ R ’ will be shown.)

Step 2 Place the lens on the support and lower the lens holder.

Step 3 Move the cross mark of prism over the center of the concentric circles.



[Figure 14. Order for Focusing]

Step 4 If the lens has astigmatism power, turn the lens so that the astigmatism angle become 180°.

INFORMATION

You don't have to control astigmatism power to 180°if there is no astigmatism power or you have no plan to mark astigmatism focus and cylindrical axis.

Step 5 Press 'MEM' button to store the measured data. If the memorizing function is working, data will be fixed. If you press the 'MEM' button again, updated value will be memorized.

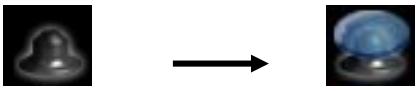
INFORMATION

‘ AUTO MEASURE ’ function is turned on in ‘ SETUP ’mode, ‘ MARKING OK ’ will be shown. And if you keep the state without any action more than 1 second, the measured data will be memorized automatically.

Step 6 Press the ‘PRINT’ button to print the measured data.

INFORMATION

You will see one of the following figures on the left-bottom of the screen according to whether there is no lens on the lens support or there is one.



Without lens with lens

[Figure 15. Display the State of Measurement]

INFORMATION

When there is no lens, you will see the figure on the left-bottom of the screen displaying lens support with no lens. If the figure displays lens support with lens but there is no one actually, consult your agent. It might be mechanic disorder or distortion.

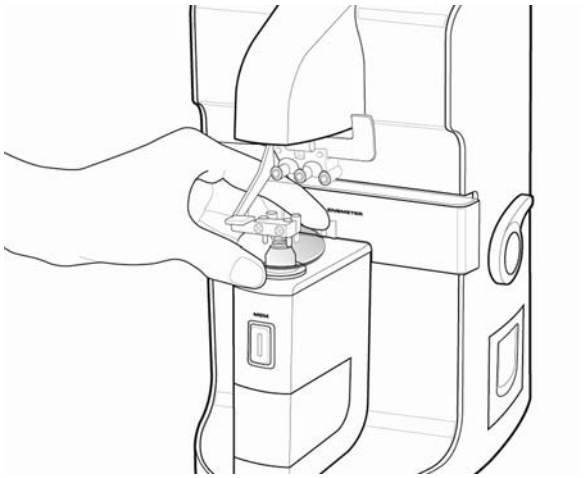
INFORMATION

In case of a lens with power, the figure on the left bottom of the screen will display lens support with lens.

CAUTION

Move lens gently and softly with care. After placing the lens on the lens support, Lower-directed impact or sudden moving might result in the scratch or crack of the lens.

9.2. Framed lenses



[Figure 16. Measurement of Framed Lens]

Step 1 Press the 'S->R' button( ) to enter the measuring framed lens environment. Then, 'L' and 'R' will be shown on the upper-left and upper-right of the screen.

CAUTION

The current measuring right lens is the side of background is highlighted with cyan color and current measuring left lens is the side of background is highlighted with violet color.

Step 2 Place the right lens on the support and lower the lens holder.

Step 3 Place the PD location sensor in the middle of the frame when PD function is on.

Step 4 Press the 'MEM' button to store the measured data.

Step 5 Lift the lens holder and place the left lens.

CAUTION

When the PD functions on, whether the lens is for right or left can be automatically detected from the location of the PD sensor. Because this detection has priority to the selection of the ' S->R ' button( ), the selection of the ' S->R ' button( ) will be ignored.

CAUTION

.You should use the ' S->R ' button ( ) to select the lens for measuring in the following three cases: when PD function (option) is not supported, PD function is off, or ' AUTO R/L ' function is off.

Step 6 Move the lens so that the 'MARKING OK' appears (focusing). And place the PD location sensor in the middle of the frame when PD function is on.

Step 7 Press the 'MEM' button to store the measured data and press the 'PRINT' button ( ) to print them.

INFORMATION

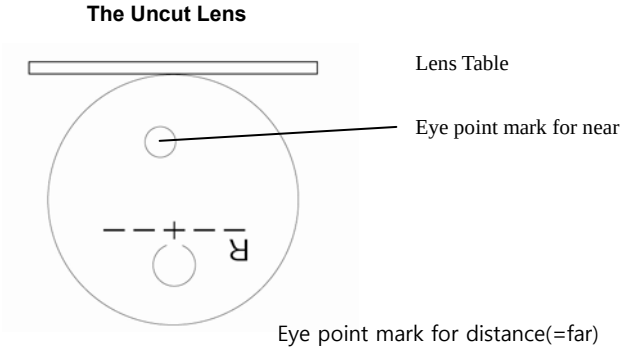
If you don't want the PD value, you can use the lens table and the horizontal support without using the PD location sensor. In this case, completely turn the PD location sensor out from the hooker. Otherwise, it can result in the interference between the PD location sensor and the lens.

CAUTION

In case that ' Auto R/L ' function is on and PD function is off, after the right lens is completed you should identify the ' No lens ' icon in the left bottom display. And then locate the left lens. In that case ' Auto R/L ' function is properly operated.

9.3. Progressive Multi-Focal Lenses

9.3.1. The structure of progressive powered lens



[Figure 17. The structure of single lens]

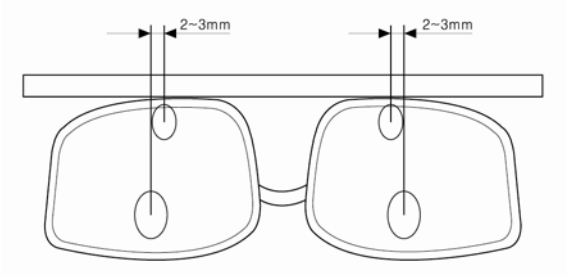
INFORMATION

The lens should be placed with its horizontal marks parallel to the lens table.

INFORMATION

Initially the lens should be placed as shown in the picture. The near vision area is beside of the lens table.

The Mounted Lens



[Figure 18. The structure of the typical progressive frame lens]

INFORMATION

The dimension of progressive powered lens depends on the specification of manufacture.

INFORMATION

The old type progressive lens may not observe the 2~3mm shift toward the frame center.

INFORMATION

Do not lift up the lens by hand at the time of measurement. Place the lens holder over the lens in order to hold the lens by foot. Then move the lens forward/backward or left/right for measurement. Lifting up the lens may cause the error in the measurement.

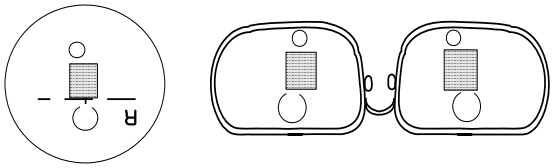
9.3.2. Judging progressive lens

Step 1 Make sure that the icon in the left bottom of display is in the standard mode as picture.

Step 2 Place the lens over the lens cap and wait 1~2 seconds.

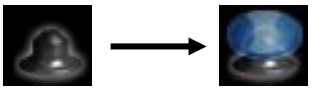
INFORMATION

It is recommended to place the lens holder over the marked (▨) area (progressive powered band).



[Figure 19. The progressive area for the automatic detection]

Step 3 The icon in the left bottom of display will be changed as below (Standard → Progressive icon). The display will be automatically changed to progressive mode.



[Figure 20. The changes of state icon]

INFORMATION

Automatic Detection may not be available in case the progressive power is less than 1D.

If so, press 'PROG' button( ) for progressive measurement.

INFORMATION

If the lens is not properly placed in Step 2, the normal lens icon (as picture) will
be displayed in Step 3. In this case, move the lens to the progressive area

for progressive measurement.

9.3.3. Measuring a progressive lens for far vision power

Step 1 Move the lens to the far vision area. In case of framed lens, move the lens till the foot of lens holder reaches to the upper frame.

Step 2 Adjust the lens left/right (horizontal) or forward/backward (vertical) in order to place the cross marker (+) at the center of target for far focus.

Step 3 The power of far focus will be automatically detected and memorized with the beep sound in case the cross marker (+) is placed at the center properly.

INFORMATION

Automatic detection may not be available if the progress area is expanded into the far vision focus. In this case placed the cross marker (+) at the close point to the center and press " MEM " button to set the focus of far vision.

INFORMATION

Do not lift up the lens by hand at the time of measurement. Place the lens holder over the lens in order to hold the lens by foot. Then move the lens forward/backward or left/right for measurement. Lifting up the lens may cause the error in the measurement.

INFORMATION

The single Lens or the framed lens should be parallel to the lens table.

9.3.4. Measuring a progressive lens for near vision power

Step 1 Move the lens to the near vision area. In case of framed lens, move the lens till the foot of lens holder reaches to the lower frame.

INFORMATION

In case the framed lens, pull the lens using the lens table in order to maintain the horizontal position.

INFORMATION

Make sure the horizontal indicator for near focus is located within the range of tolerance (No. 2 of [figure 7] – page 29).

INFORMATION

In case the horizontal indicator is out of the tolerance range, move the right lens to right (left lens to left), since the near focus is located at 2~3mm toward the center of frame.

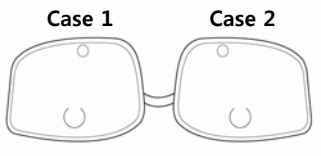
Step 2 Pull the lens till the vertical indicator for near focus reaches to the criteria for near focus. Then, the add value will be automatically detected and memorized with the beep sound.

INFORMATION

(case 1) As for small framed lens, the near focus is very closed to the lower frame. In this case, pull the lens a little bit more while lifting up the lens holder in order to detect the near focus. ([figure 21]).

INFORMATION

(case 2) There may be the smallest framed lens in which the near focus is cut-out. In this case, adjust the lens to make the level of vertical indicator minimized while securing the tolerance range of horizontal indicator. Then press " MEM " button to set the focus of near vision. (Measurement date may be a little bit different from the actual data). ([figure 21]).



[Figure 21. The small framed lens]

INFORMATION

The old type progressive lens may not observe the 2~3mm shift toward the frame center.

9.3.5. Troubleshooting for progressive measurement

① Do not detect the progressive lens automatically

Cause 1 : Lens holder is not located in the progressive area (Normal lens icon will be displayed in the left bottom of display.)

Solution : Move the lens to the progressive area for progressive measurement.

Cause 2 : The progressive power is less than 1D.

Solution : Move the lens to the close point of near focus and then press "MEM" button for progressive measurement.

② Detect the normal lens as the progressive lens

Cause 1 : Lens is not properly manufactured (enormous deviation in the lens)

Solution : You can cancel the progressive auto-detection function in set-up display for system variable(Refer to Section 8.6).

③ Difficult to detect the far vision focus

Cause 1 : The progressive area is expanded into the far vision focus
Solution : Place the cross marker(+) at the close point to the center and press "MEM" button to set the focus of far vision

Cause 2 : The far focus is close to the upper frame
Solution : Push the lens a little bit more while lifting up the lens holder in order to detect the far focus

④ Difficult to detect the near vision focus
Cause 1 : The near focus is close to the lower frame
Solution : Pull the lens a little bit more while lifting up the lens holder in order to detect the near focus.

Cause 2 : The near focus is cut out because of small framed lens
Solution : adjust the lens to make the level of vertical indicator minimized whiling securing the tolerance range of horizontal indicator. Then press "MEM" button to set the focus of near vision in case the add power is maximized. (Measurement date may be a little bit different from the actual data).

⑤ Error in the measurement data (especially the lens over -4D of near vision power)
Cause 1 : Lift up the lens by hand at the time of measurement
Solution : Place the lens holder over the lens in order to hold the lens by foot. Then move the lens forward/backward or left/right for measurement.

⑥ Difficult to maintain the horizontal position in case of near vision measurement
Cause 1 : Wrong measurement of far vision focus
Solution : Retry the measurement of far vision focus

⑦ The marker (O,⊙) is displayed more than two times
Cause 1 : The lens is not properly manufactured (more than to points with the deviation of progressive power)
Solution : Detect the maximized add value of the points.

9.4. General Multi-focal Lenses

9.4.1. Measuring at the Normal Display

Step 1 Press the ‘ MEM ’ button after placing the lens over the first focus.

Step 2 Press the ‘ MEM ’ button after placing the lens over the second focus. The first ‘ADD’ value will be shown.

Step 3 At this time, ADD value isn’t frozen. Therefore if you guess the value correct, press the ‘ MEM ’ button once more.

Step 4 Press the ‘ ADD ’ button( ) to enter the measurement mode for the second ADD value.

Step 5 Press the ‘MEM ’ button after placing the lens over the third focus. The second ‘ADD ’ value will be memorized.

9.4.2. Measuring at the Progressive Display

Step 1 Press the ‘ PROG ’ button( ) to activate the progressive display.

Step 2 Place the lens over the first focus.
The measurement is done automatically.

Step 3 Move the lens over the second focus. And then the measurement is done automatically.

INFORMATION

At every step, in case that automatic measurement isn't done or you want a manual decision, please press the ' MEM ' button

9.5. Soft Contact Lenses

We have to prepare the mechanical jig for measuring a soft contact lens. The procedures to measure a soft contact lens are as followings.

Step 1 Select the 'SOFT CONTACT' after choosing the 'LENS' item in the setup screen.

Step 2 Remove the lens support and prepare the contact lens jig. Rotate two jogs for the body to go to the middle of the structure.

Step 3 Clear the moisture on contact with lens toil. And then wait about in 10sec to make its shape rounded.

Step 4 Take out the soft contact lens with a tweezers and place the soft contact lens on the cap of the mechanical jig.

Step 5 Place the mechanical jig on the pin hole housing. Rotate two jogs for the cross marker to go to the center of the display.

Step 6 Be sure that the heights of all score bars are higher than the criteria line. Otherwise wait a little bit more, or move the soft lens a little bit so that the height of score bars become equal or more than the criteria line.

Step 7 Press the 'START RECORD' button( ) to trigger the continuous measurement. After a few second, Press the 'STOP RECORD' button( ).

INFORMATION

You can specify the measurement duration at the User Setup Page. And then if you turn on the 'AUTO REC' function, it is unnecessary for you to press 'STOP RECORD' button( ) to stop the continuous measurement. It stops automatically after the specified seconds.

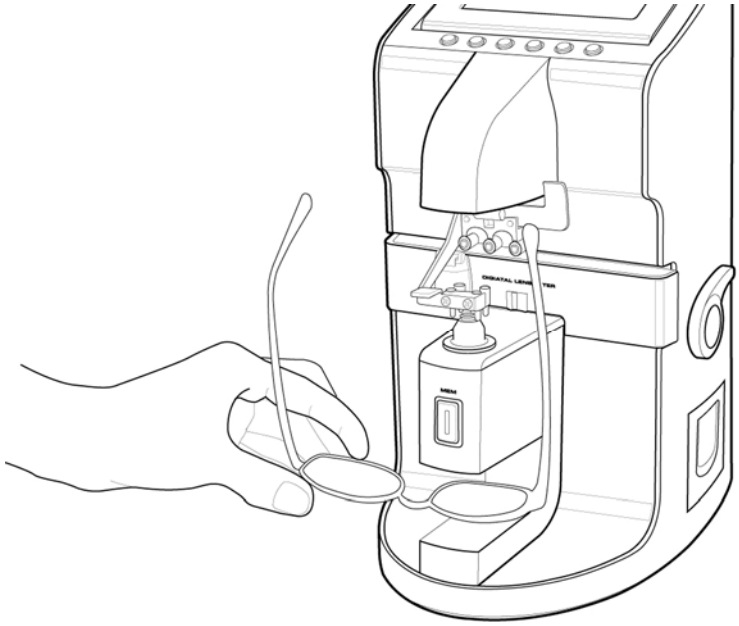
9.6. Hard Contact Lenses

Step 1 Select the ‘HARD CONTACT’ after choosing the ‘LENS’ item in the setup screen.

Step 2 Wipe off the water and place the lens with its convex surface down.

Step 3 Press the ‘MEM’ button to store the measured data and press the ‘PRINT’ button( ) to print them.

9.7. Transmission Ratio of UV Light



[Figure 22. How To Measure Transmission Ratio of UV Light]

Step 1 Select the ‘UV’ after choosing the ‘LENS’ item in the setup screen.

Step 2 Pull and extract the UV cover.

Step 3 Press the ‘CAL’ button( ) to calibrate the transmission ratio into 100% if it is not.

Step 4 Place the lens on the UV detector.

Step 5 Press the ‘MEM’ button to memorize the transmission ratio and press the ‘PRINT’ button( ) for printing the measured data.

NOTE

As it measures UV transmission ratio by assuming plano-concave, result can include some error due to refractive power of measuring lens.

9.8. D-Sunglasses Lenses

Step 1 Select the ‘D-SUNGLASSES’ after choosing the ‘LENS’ item in the setup screen.

Step 2 Press the ‘MEM’ button after placing the lens over the focus.

Step 3 Press the ‘PRINT’ button( ) to print them.

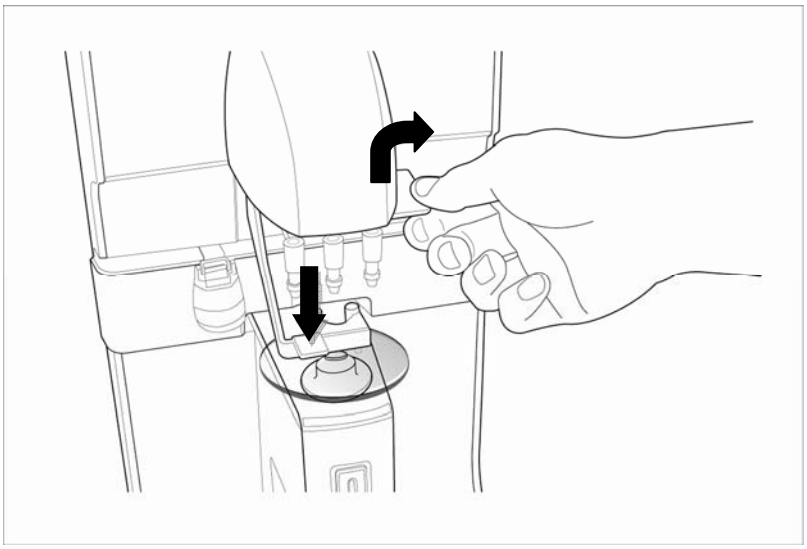
9.9. Marking Focus and Cylindrical Axis

9.9.1. When there is no astigmatism

Step 1 Place the lens and control the lens so that it becomes ‘MARKING OK’

Step 2 Turn the Marking lever, which is vertical, by 90° to make it horizontal. And then, mark focus and cylindrical axis.

Step 3 Mark focus and cylindrical axis by using the marking lever.



[Figure 23. How To Mark Focus and Cylindrical Axis]

9.9.2. When there is astigmatism

Step 1 Place the lens and control the lens so that it becomes ‘MARKING OK’.

Step 2 Keep ‘MARKING OK’ and control lens up to the angle of prescription slip.

Step 3 Turn the Marking lever, which is vertical, by 90° to make it horizontal. And then, make marking focus and cylindrical axis.

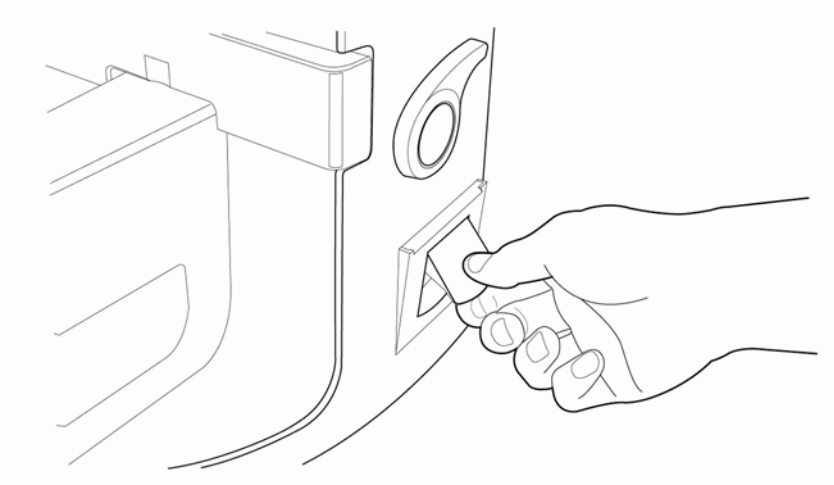
9.10. Prism

Step 1 Change the display format as the form (X-Y, P-B, mm) in the prescription slip. You can do this on the setup screen.

Step 2 Control the lens so that the display value on the screen coincides with the prescribed prism value.

10. Maintenance

10.1. Replacing Printing Paper



[Figure 24. How to Replace the Printing Paper]

Step 1 Open the printer cover.

Step 2 Insert the paper into the printer shaft and put the shaft into the pre-defined position.

Step 3 Lift the printer lever and insert the shaft with paper.

Step 4 Lower the printer lever and turn the feeding velvet to roll the paper.

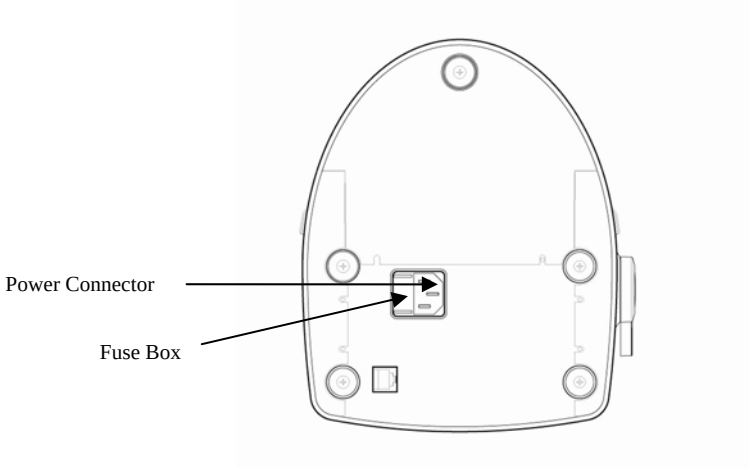
Step 5 Close the printer cover.

Step 6 Advance the paper out of the printer cover.

INFORMATION

Use a thermal printing paper of the width 57mm and the diameter of roll 50mm.

10.2. Replacing Fuse



[Figure 25. Replacing fuse]

Step 1 Pull out the fuse box.

Step 2 Replace the old one with the new one.

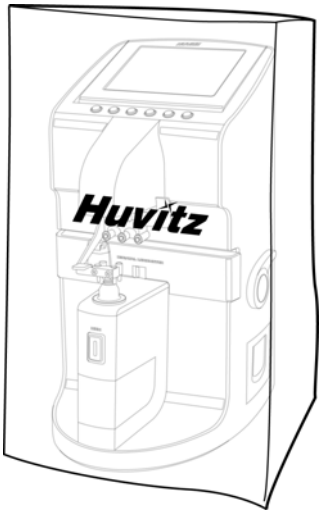
Step 3 Put into the fuse box with the new one.

INFORMATION

Use 250V, T3.15AL fuse for the Auto Lensmeter HLM-7000.

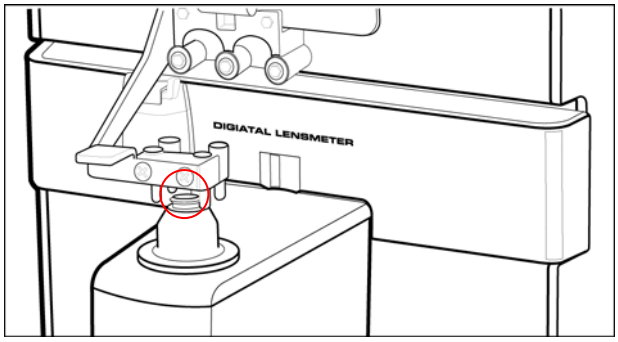
10.3. Storage

During night time, be sure to cover the dust cover as the below picture, because some dust might make spoil your equipment.



[Figure 26. Storage for night time]

If you don't use your equipment for one week or more, make sure that the dust cap should be fitted into the lens cap as the below picture.



[Figure 27. Storage for one week or more]

10.4. Disposal

NOTE

To dispose the instrument, accessories, and components, follow local governing ordinances and recycling plans regarding disposal or recycling of instrument or device components. Especially a lithium battery may pollute the environment if the instrument or a lithium battery is abandoned.

When disposing packing materials, sort them by the materials and follow local governing ordinances and recycling plans.

11. Troubleshooting

11.1. Various Messages

Message box shows information when you are measuring or this instrument is out of order.

Here is the description on messages that appear in measuring.

ALIGNMENT OK : When the optic center falls within 0.5 prism.

MARKING OK : When the optic center is correct.

OFF CENTER : When the optical center of lens is off too much.

Following messages are on out-of-working problem.

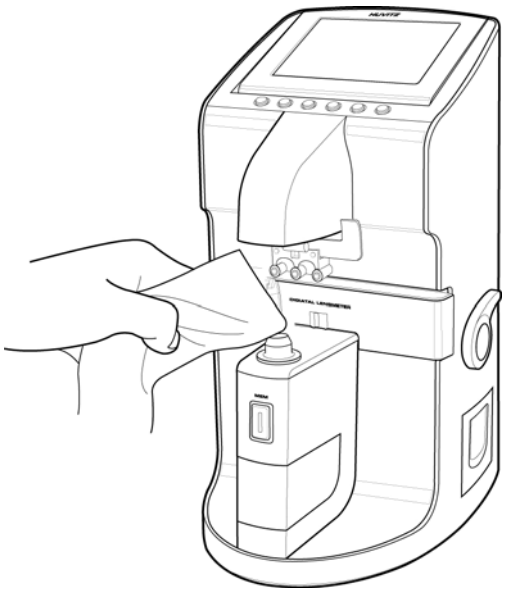
NO SIGNAL : Is displayed when there is no signal.

OUT OF RANGE : Is displayed when there is out of range signal.

UNSTABLE SIGNAL : Contact lens measurement, when signal is bad, appear.

11.2. How to clean pin hole

While your machine is being started up, if there is the warning message, “No Signal” or “Out of range”, please clean the 4-pin hole at first. Just use your lens towel as the below picture. But, don’t use liquids such as alcohol, acetone, etc.



[Figure 28. Cleaning 4-pin hole]

CAUTION

Never use liquids such as alcohol, acetone, etc. Because such liquids might melt the glue on the 4-pin hole.

After that, if the message “No Signal” or “Out of range” isn’t be disappeared, please ask to your local distributor or the Huvitz service department.

12. Specifications

Specification Table

Measurement Range	
Sphere Power	-25D ~ +25D
Cylinder Power	0 to ±10.00D
Cylinder Axis	0° ~ 180° degrees(1° Step)
Add Power	0 to +10D
Prism Power	0 to 10Δ
Precision	
Diopter Steps	0.01 / 0.125 / 0.25D
Prism Power	0.01 / 0.125 / 0.25Δ
Measurement Modes	
Cylinder	+ , ±, -
Prism	Rectangular / Polar/Displacement
Sampling Speed	0.016 seconds
LED Wavelength	630 nm
Contact Lenses	Hard and Soft
Abbe Values	Manual Compensation
Wavelength	e-Line, d-Line

Display	TFT LCD Display (320X240 LED Backlight)
Data Output	RS-232C, Printer
BPS	9600,19200,38400,57600,115200 bps
Dimensions	190(W) x 237(D) x 377(H) mm 7.48 in. x 9.33 in. x 14.84 in.
Weight	5.5Kg
Power Supply	AC 100 - 240 V ~, 50~60Hz, 1A

13. Service Information

How to contact service: If there are any problems with the equipment, please follow the steps below:

- First of all, refer to the 10. Maintenance and 11. Troubleshooting sections according to the problem that you are encountered. And then follow the suggested sequences.
- If the problem persists, please contact the local distributor in your province or country at first.
- Before calling to the local distributor, you'd better check these information such as Model and Serial Numbers. To do so, fill up the following table as soon as you purchase our product. You can look up these information at any time. The serial number is found on the back of this unit. The serial number is unique to this unit. You should retain this manual as a permanent record of your purchase. Please retain your purchase receipt as your proof of purchase.

Date of Purchase : _____

Dealer's Name : _____

Dealer Address : _____

Dealer Phone No. : _____

Model No. : _____

Serial No. : _____

- If you can't contact with your local distributor, you can directly get in touch with the service department of the HUVITZ using the phone number and the address written in the below table.

How to Contact HUVITZ Co., Ltd

Write us at:

HUVITZ Co., Ltd.
Huvitz B/D, 689-3
Geumjeong-dong Gunpo-si
Gyeonggi-do, South Korea
435-862

Tel: +82-31-442-8868
Fax: +82-31-442-8619
URL:**http://www.huvitz.com**
e-mail: clm-support@huvitz.com

HLM-7000 DIGITAL LENSMETER

9990 NW 14 Street | Suite 105 | Doral, FL 33172
Telephone: 888.334.4640